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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------|------------------|
| 10/813,232 | 03/31/2004 | Morio Gaku | 2004_0517 | 3868 |
| 513 | 7590 | 09/28/2005 | EXAMINER | |
| WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021 | | | ELVE, MARIA ALEXANDRA | |
| | | ART UNIT | | PAPER NUMBER |
| | | 1725 | | |

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|-------------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/813,232 | GAKU ET AL. |
| | Examiner M. Alexandra Elve | Art Unit 1725 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 31 March 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 13-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 13-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 31 March 2004 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 09/271,897.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>3/31/04</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 17 is objected to because of the following informalities: "under heat under pressure". For examination purposes the examiner has assumed that the second occurrence of "under" should be "and". Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13 & 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. (USPN 4,751,146) in view of Hanson (USPN 5,863,446).

Maeda et al. discloses a laminate printed circuit board. It is constructed of several layers; one of the layers is made up of mixtures of ethylene/comonomer copolymer, heat-conducting inorganic filler, glass fiber (or glass cloth or mat). Another layer is an electrically conductive layer, which may be a metal foil, metal plating or metal deposition. Copper is one of the metals used. Other layers may contain a thermosetting resin and a heat-resistant thermoplastic layer. Although Maeda et al. teach a circuit board which is used for mounting semiconductor devices, through hole device affixation is not specifically taught.

Hanson discloses using a laser to make blind vias and through vias in a laminate substrate (printed circuit board). Vias are drilled using a laser with energy densities per pulse from 2 J/cm^2 to 10 J/cm^2 . Additionally, a polymeric photoabsorptive layer (auxiliary material) was applied on the top surface of the laminate substrate in order to enhance the quality of a via entrance. The exit variance of a through via can be enhanced by applying a polymeric photo-absorptive layer on the exposed bottom surface of the laminate substrate and a conductive layer in intimate contact with the photo-absorptive layer (backup sheet). It would have been obvious to one of ordinary skill in the art at the time of the invention to drill vias in a printed circuit board, as taught by Hanson, in the Maeda et al. board because these are merely variations used for device affixation.

The prior art discloses a product substantially similar to a claimed product, differing only in the manner by which it is produced. It has been held that one of ordinary skill in the art at the time of the invention would have considered the claimed compositions to have been obvious because of the similarity in properties. The burden falls to the applicant to show that any process steps associated with the claimed product result in a materially different product from those of the prior art, because there is nothing in the record before the examiner to reasonably conclude that applicant's product differs in kind from those obtained by the references. See *In re Brown* 173 USPQ 685 and *In re Fessmann* 180 USPQ 324.

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Claims 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al. in view of Hanson, as stated in the above rejection of claims 13 & 19-20, and further in view of Gannon (USPN 5,916,401).

Maeda et al. and Hanson teach the presence of a polymeric photoabsorptive layer (auxiliary material) applied to the top surface of the laminate substrate in order to enhance the quality of a via entrance, but do not teach the use of a water soluble material.

Gannon discloses the use of a coating on a substrate. One suitable coating material is a water soluble polymer. It would have been obvious to one ordinary skill in the art at the time of the invention to use a water soluble polymer, as taught by Gannon, in the Maeda et al. and Hanson polymeric photoabsorptive layer (auxiliary material) because of the ease of removal in a manufacturing environment and hence enhanced production efficiency.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Alexandra Elve whose telephone number is 571-272-1173. The examiner can normally be reached on 6:30-3:00 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

September 23, 2005.



M. Alexandra Elve
Primary Examiner 1725